

No. 722,146.

PATENTED MAR. 3, 1903.

A. J. ROBERTSON.
PISTON HEAD.

APPLICATION FILED APR. 2, 1902.

NO MODEL.

Fig. 1.

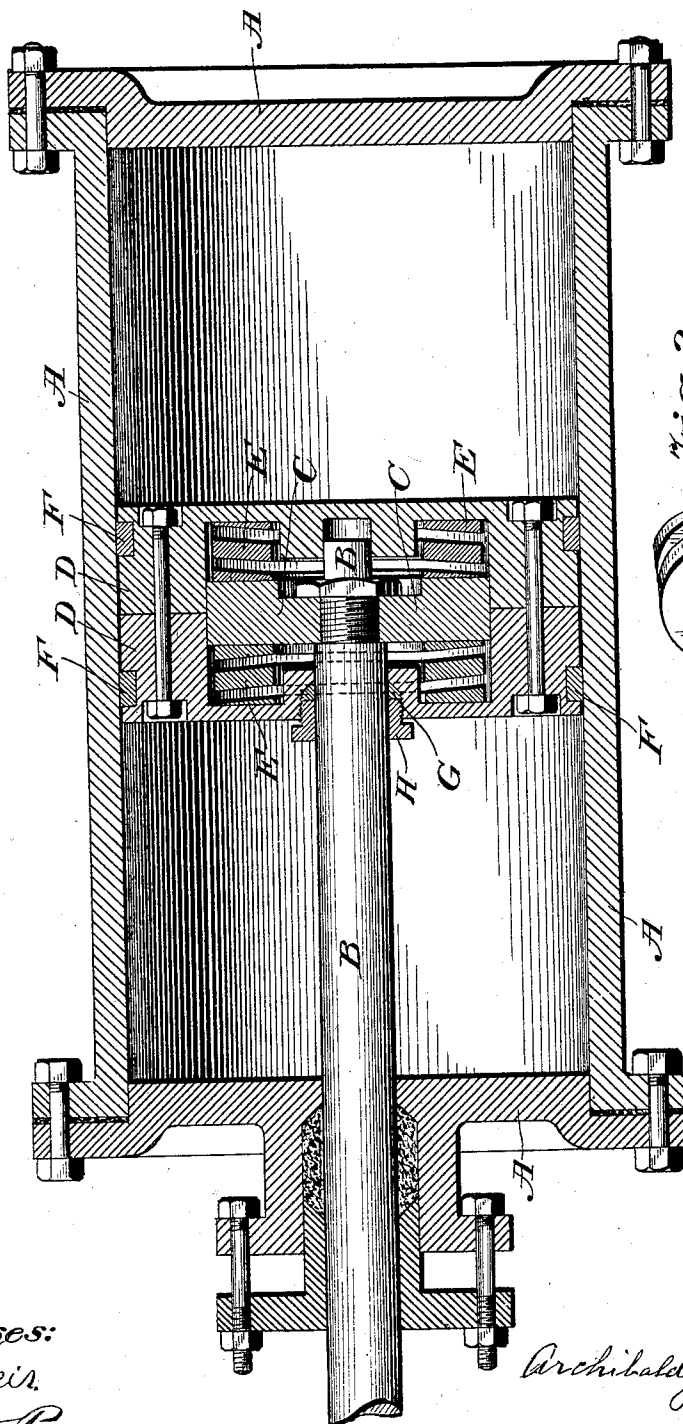
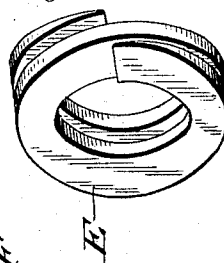


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

ARCHIBALD J. ROBERTSON, OF CHICAGO, ILLINOIS.

PISTON-HEAD.

SPECIFICATION forming part of Letters Patent No. 722,146, dated March 3, 1903.

Application filed April 2, 1902. Serial No. 101,092. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD J. ROBERTSON, a subject of the King of Great Britain, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Piston-Heads, of which the following is a specification.

This invention relates to pistons in reciprocating engines; and the object is in general to provide an elastic or resilient connection between the piston-rod and piston-head, whereby to relieve working parts of the engine from sudden, violent, and unusual strains.

A further object of my invention is the construction of an elastic or resilient piston in which is stored at least a small portion of the energy developed by the first impact of the motive agent to retain a more nearly uniform driving pressure throughout the whole stroke or cycle.

My device is particularly adapted for use in reciprocating engines for motor-vehicles, where the various working parts are necessarily small in size and light in weight and where unusual or excessive strains are likely to be produced in starting and stopping. Where a rigid piston-head is employed, the impact of the motive agent is against unyielding parts, and the pressure must be sufficient to start the vehicle before the piston-head will start to move. A piston embodying my invention will afford means for exerting a more gradually accelerated pressure against the piston-rod and its connections, thereby avoiding sudden and unusual strains.

My invention consists generally in a double piston-head, the piston-head proper, which receives the impact of the steam or other motive agent, itself constituting a smaller cylinder, within the chamber of which, rigidly attached to the piston-rod, a subordinate or secondary head or disk is capable of a limited reciprocating motion and my invention further consists in the employment within the piston-head chamber of connecting means between the primary and secondary heads to give elasticity or resiliency to their relative movement; and my invention further consists in the various details of construction and in combinations of parts, all as hereinaf-

ter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a central vertical longitudinal section of a cylinder and piston therein embodying my invention. Fig. 2 is a perspective view of the preferred form of coil-spring employed to provide the desired resiliency.

Referring now to the drawings in detail, I have shown a cylinder A and a piston-rod B of common or usual pattern and construction. The piston-head proper to facilitate manufacture with an interior chamber and to provide for the placing and adjustment of the parts therein preferably comprises the two similar and separable cup-shaped disks D D, rigidly bolted together. Into the cylindrical chamber formed by these disks extends the piston-rod B, carrying at its extremity, rigidly and suitably attached thereto, the subordinate or secondary disk or head C, preferably occupying the entire vertical sectional area of said chamber and capable of a limited reciprocating motion therein. The construction of this disk and chamber is analogous to the construction of the ordinary piston-head and cylinder in all save that the proportions are necessarily different and the movement of the disk much more limited. At each side of the secondary disk or head I have shown a coil or spiral spring E of suitable size and weight, each being normally slightly and uniformly compressed to retain said secondary disk substantially in the middle of the chamber. Movement of the disk with reference to the piston-head within the chamber of which it is located in either direction is thus subject to the resistance of one or the other of these springs. The piston-head proper is provided with the usual packing-rings F F, and G represents a packing-ring to prevent the entrance of steam into the interior chamber, retained in place by means of the apertured nut H.

It will be apparent that when the steam or other motive agent enters the cylinder at either side of the piston-head proper a slight motion will be imparted to said head proper

before power is communicated to the working parts. In this manner not only will sudden and unusual strains upon these parts be prevented, but when said head is driven in either direction one or the other of said springs will be under greater (and its opposite less) than normal compression, resulting in at least a small storage of energy, which is utilized to retain a more nearly uniform driving pressure for a longer period of time during the stroke or cycle than would be possible when a rigid head was employed.

I do not desire to be limited to the use of spiral or other springs to provide the desired resiliency. It is obvious that with proper air-tight connections compressed air may be utilized to serve the same purpose and possibly in an even more satisfactory manner. The essentially novel feature of my invention is the employment of a double piston-head, the primary being provided with a cylindrical chamber within which the secondary is capable of an independent reciprocating motion, and means for giving resiliency to the relative movement between the two.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a piston for reciprocating engines, the combination, with a primary piston-head provided with an interior chamber and a piston-

rod extending into said chamber, of a secondary head or disk rigidly attached to said rod to reciprocate within said chamber, and means for giving elasticity to the relative movement of said primary and secondary heads.

2. In a piston for reciprocating engines, the combination, with a primary piston-head provided with an interior cylindrical chamber and a piston-rod extending into said chamber, of a secondary head or disk rigidly attached to said rod to reciprocate independently within said chamber, and means within said chamber for giving elasticity to the relative movement of said primary and secondary heads.

3. In a piston for reciprocating engines, the combination, with a primary piston-head provided with an interior chamber and a piston-rod extending into said chamber, of a secondary head or disk rigidly attached to said rod to reciprocate independently within said chamber, and a suitable compression-spring at each side of said secondary head to give resiliency to the relative movement of said primary and secondary heads.

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Witnesses:

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